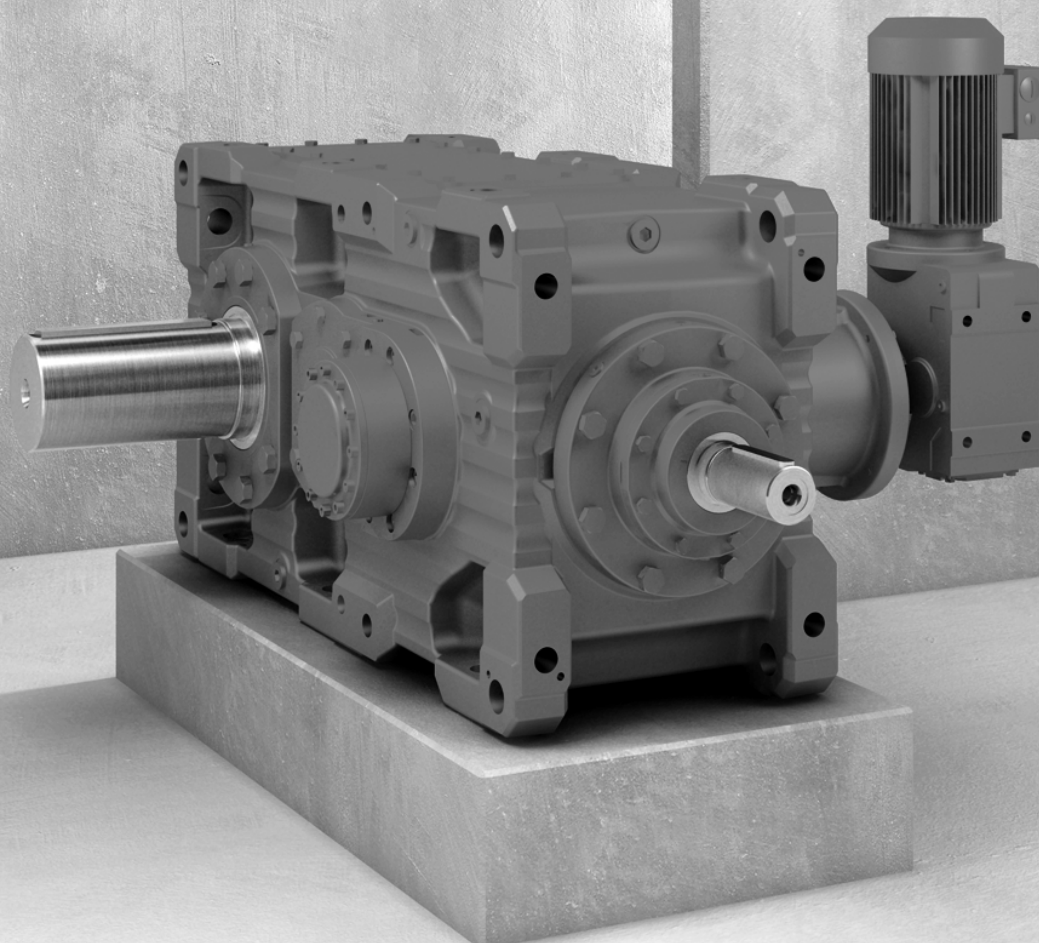




SEW
EURODRIVE



**Industrial Gear Units:
Bevel-Helical Gear Units
X.. Series Bucket Elevator Drives**

Edition 11/2007

11642211 / EN

Operating Instructions





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General Information

Structure of the safety notes

1 General Information

1.1 Structure of the safety notes

The safety notes in these operating instructions are structured as follows:

Symbol	SIGNAL WORD
 General hazard	Nature and source of hazard. Possible consequence(s) if disregarded. • Measure(s) to avoid the hazard.

Symbol	Signal word	Meaning	Consequences if disregarded
Example: General hazard Specific hazard, e.g. electric shock	HAZARD WARNING CAUTION	Imminent hazard Possible hazardous situation Possible hazardous situation	Severe or fatal injuries Severe or fatal injuries Minor injuries
	NOTE ON EXPLOSION PROTECTION	Important note on explosion protection	Suspension of explosion protection and resulting dangers
	STOP!	Possible damage to property	Damage to the drive system or its environment
	NOTE	Useful information or tip Simplifies drive system handling	



1.2 Introduction

	STOP A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that you adhere to the notes and instructions provided in the following publications: • Operating Instructions for Industrial Gear Units: Helical and Bevel-Helical Gear Units X.. Series Horizontal • Operating Instructions for R..7, F..7, K..7, S..7, SPIROPLAN® W Gear Units • Operating Instructions for AC Motors, Asynchronous Servomotors Consequently, read the operating instructions before you start working with the gear unit! The operating instructions contain important information about servicing and should be kept close to the gear unit.
--	---

1.3 Exclusion of liability

You must comply with the information contained in these operating instructions to ensure safe operation of the bucket elevator drives and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.



2 Safety Notes

2.1 Preliminary remark

	STOP
	Please do adhere to the safety notes of the operating instructions indicated in chapter one!

2.2 General information

Never install damaged products or take them into operation. Submit a complaint to the shipping company immediately in the event of damage.

During operation, the motors and gearmotors can have live, bare and movable or rotating parts as well as hot surfaces, depending on their enclosure.

Explosive gas mixtures or dust concentrations in combination with hot, energized and moving parts of electrical machinery can cause serious injury or death.

All work related to transportation, putting into storage, setup/mounting, connection, start-up, maintenance and repair may only be carried out by qualified personnel observing

- the relevant detailed operating instructions
- the warning and safety signs on the motor/gearmotor
- all other project planning documents, operating instructions and wiring diagrams belonging to the drive
- the specific regulations and requirements for the system
- the national/regional regulations governing safety and the prevention of accidents

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Consult the documentation for additional information.

2.3 Designated use

The bucket elevator drives are units run by motors for industrial and commercial systems. The units may only be run at the speeds and powers shown in the technical data or on the nameplate. Implementing gear unit loads other than the permitted values or operating the gear units in areas of application other than industrial and commercial systems is only permitted after consultation with SEW-EURODRIVE.

For the purpose of EC Machinery Directive 98/37/EG, the bucket elevator drives are components for installation in machinery and systems. In the scope of the EC directive, you must not take the machinery into operation in the proper fashion until you have established that the end product complies with Machinery Directive 98/37/EC.



3 Structure

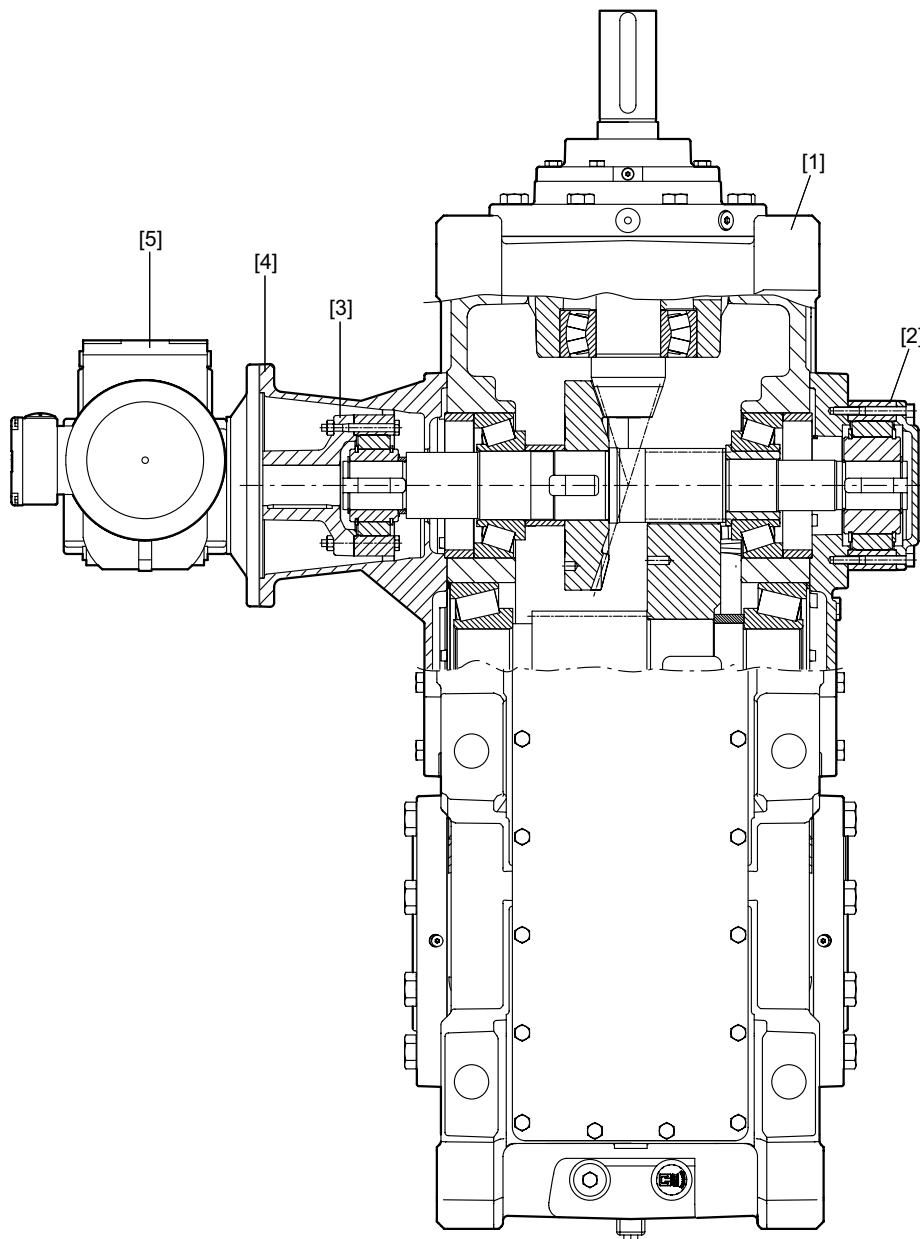
3.1 Bucket elevator drive

The bucket elevator drive is a three-stage bevel-helical gear unit of the X series [1] with backstop [2] and auxiliary drive [5]. The auxiliary drive is connected via an auxiliary drive adapter [4] and an overrunning clutch [3].



NOTE

The three-stage bevel-helical gear units [1] are delivered without lubricant fill. The auxiliary drive [5] is already filled with lubricant.



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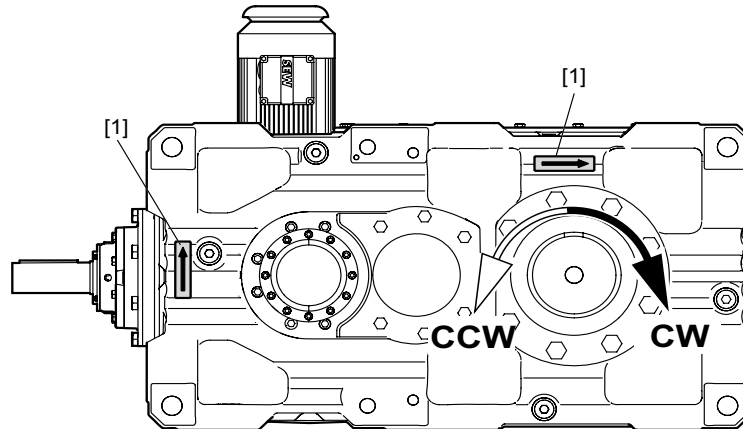
- [1] Three-stage bevel-helical gear unit X.K..
- [2] Backstop
- [3] Overrunning clutch
- [4] Auxiliary drive adapter
- [5] Auxiliary drive



3.2 Backstop

The purpose of a backstop is to prevent undesirable reverse rotation. During operation, the backstop permits rotation in one specified direction of rotation only.

The backstop functions by using centrifugal lift-off sprags. Once the lift-off speed is reached, the sprags completely lift off from the contact surface of the outer ring. The backstop is lubricated with gear oil.



527646219

The direction of rotation is determined with a view to the output shaft (LSS).

- CW = Clockwise
- CCW = Counterclockwise

The permitted direction of rotation [1] is indicated on the housing.



NOTE

If the drive has a through-going output shaft, the direction of rotation of the backstop should be given as viewed towards shaft position 3.



STOP

The backstop may wear off during operation below lift-off speed. This is why you should consult SEW-EURODRIVE for defining the maintenance intervals for:

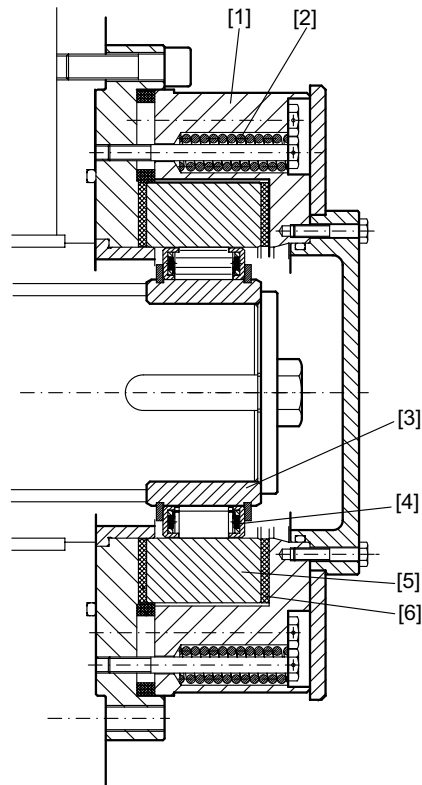
- Input speed rates $n_1 < 1400$ rpm
- X4K.. design with $i_{tot} \geq 200$



3.3 Torque-controlled backstop

Torque-controlled backstops are used in dual drives where both drives are equipped with a backstop.

The torque control prevents the restoring moment from being unevenly distributed to the individual backstops. Dynamic torque peaks are also reduced during the lock phase.



539377931

- | | |
|------------------------|---------------------|
| [1] Housing | [4] Freewheel cage |
| [2] Compression spring | [5] Outer ring |
| [3] Inner ring | [6] Friction lining |

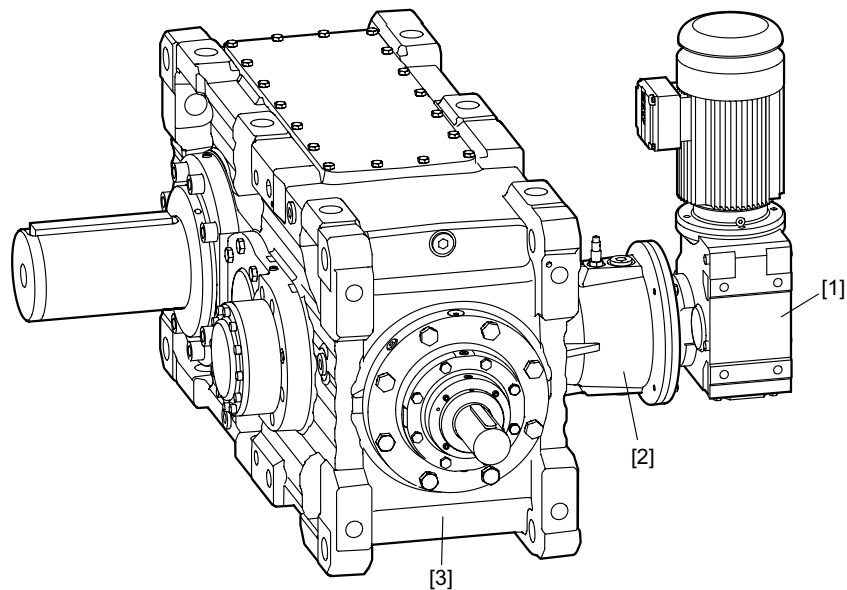
As with a backstop without torque control, the locking torque is transmitted to the outer ring via sprags.

However, for a torque-controlled backstop, the outer ring [5] is not securely bolted on the gear unit housing. It is held between two friction linings [6]. The friction linings are loaded via a housing [1] with screws and compression springs [2].



STOP

The slip torque is factory-set. Changing the slip torque is not permitted.



635820299

- [1] Auxiliary drive
- [2] Auxiliary drive adapter
- [3] Bevel-helical gear units

3.4 Overrunning clutch

The overrunning clutch is a part of the auxiliary drive adapter [2]. Via the auxiliary drive [1] it allows for an operation with one direction of rotation.

When the main drive is in use, the overrunning clutch is in no load-operation. When the auxiliary drive is used, i.e. in transfer operation, the input shaft of the bevel-helical gear unit [3] is rotating slowly.

The rotary motion of the input shaft of the bevel-helical gear unit [3] must not be obstructed. A brake on the input side of the main drive must be released for auxiliary drive operation.

The overrunning clutch is integrated in the oil circuit of the bevel-helical gear unit [3], thus maintenance and oil change for the overrunning clutch and the bevel-helical gear unit [3] are carried out at the same time.

3.5 Auxiliary drive

The auxiliary drive [1] is available in an "empty bucket" design (solely for maintenance purposes) or "full buckets" design. Depending on the design, SEW helical worm or bevel-helical gearmotors are used. The auxiliary drive [3] is mounted to the bevel-helical gear unit [2] via an auxiliary drive adapter. Refer to the order documents for the exact output torque rates in auxiliary drive operation.

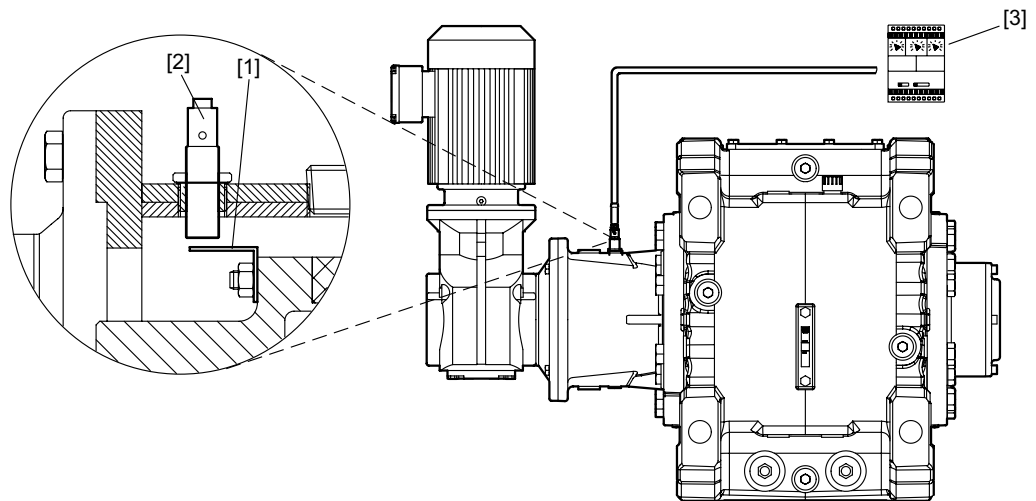
Main drive and auxiliary drive are to be interlocked so that only one of the two motors can be switched on.

The auxiliary drive has its own oil circuit, separated from the oil circuit of the bevel-helical gear unit.



3.6 Speed monitor

	STOP
For safety reasons, the overrunning clutch must be equipped with a speed monitor. This is because, in case of a malfunction, the overrunning clutch may be damaged due to overspeed!	



485755787

- [1] Trigger cam
- [2] Inductive encoder
- [3] Speed monitor (optional)

The speed of the overrunning clutch is detected in a contactless manner via trip cam [1] and an inductive conductor [2]. The speed monitor [3] compares the pulses with a preset switching speed (→ 5.2).

If the switching speed is exceeded (e.g. due to a malfunction of the overrunning clutch), the output relay switches (optionally NC contact or NO contact). The connection must be made so the main drive is switched off in this situation. Thus, an overspeed at the auxiliary drive will be prevented.

	NOTE
Please contact SEW-EURODRIVE if other components than those listed here are used for speed monitoring.	
The encoder is included in the standard scope of delivery. The speed monitor, which is not included, can be ordered separately.	



4 Installation / Assembly



STOP

For installation / assembly, please do adhere to the safety notes in chapter 2 and to the safety notes of the publications indicated in chapter 1!

4.1 Installing the bucket elevator drive

The bucket elevator drive is designed for a horizontal mounting position.



STOP

Contact SEW-EURODRIVE for differing mounting positions!

4.2 Pouring in the lubricant

The X.K.. bevel-helical gear unit and the auxiliary drive adapter must be filled with the prescribed oil grade and volume (→ nameplate, chapter "lubricant fill quantities").

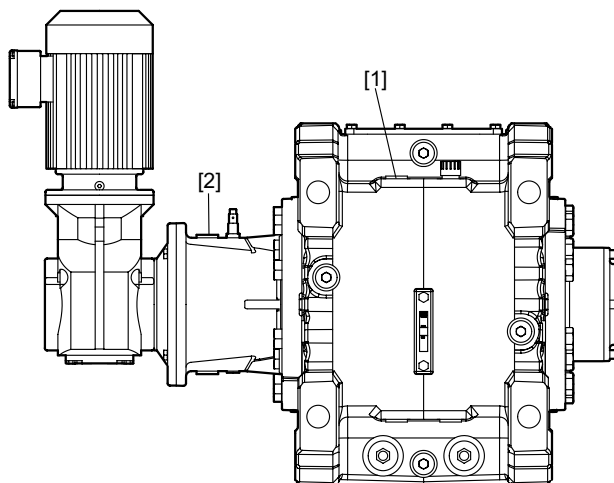


HAZARD!

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before starting work and protect it against unintentional re-start.



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- [1] Oil filling plug of the X.K..bevel-helical gear unit
[2] Oil filling plug of the auxiliary drive adapter

1. Remove the oil filling plugs of the bevel-helical gear unit [1] and the auxiliary drive adapter [2].



NOTE

The oil volume indicated on the nameplate is a guide value representing the total fill quantity.

The auxiliary drive adapter is to be filled with a prescribed partial quantity. The rest of the oil is to be filled into the bevel-helical gear unit.

2. Fill the prescribed partial oil quantity into the auxiliary drive adapter via the oil filling plug [2].

Gear unit	Auxiliary drive adapter	
	"Empty buckets" ltr.	"Full buckets" ltr.
X3K.180 / X3K.190	4	6
X3K.200 / X3K.210	5	9
X3K.220 / X3K.230	8	13
X3K.240 / X3K.250	10	16

- Use a funnel to fill the oil (filter mesh max. 25 µm).

3. Fill the rest of the oil into the bevel-helical gear unit via the oil filling plug [1].

Gear unit	X.K..bevel-helical gear unit ltr.
X3K.180 / X3K.190	75
X3K.200 / X3K.210	104
X3K.220 / X3K.230	143
X3K.240 / X3K.250	176

- Use a funnel to fill the oil (filter mesh max. 25 µm).

4. Check whether the oil level is correct using the oil level glass or the oil dipstick.



STOP

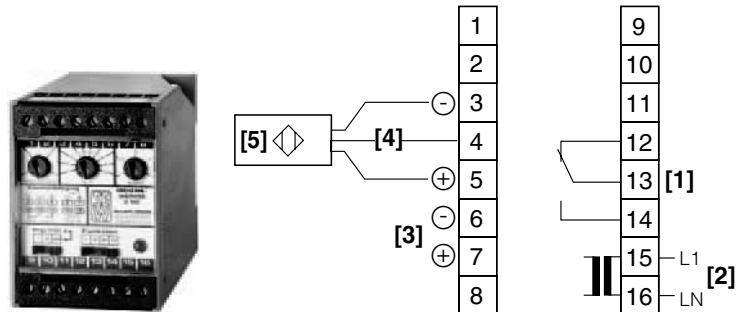
Any dripping oil must be removed immediately with an oil binding agent.



4.3 Speed monitor

4.3.1 Speed monitor

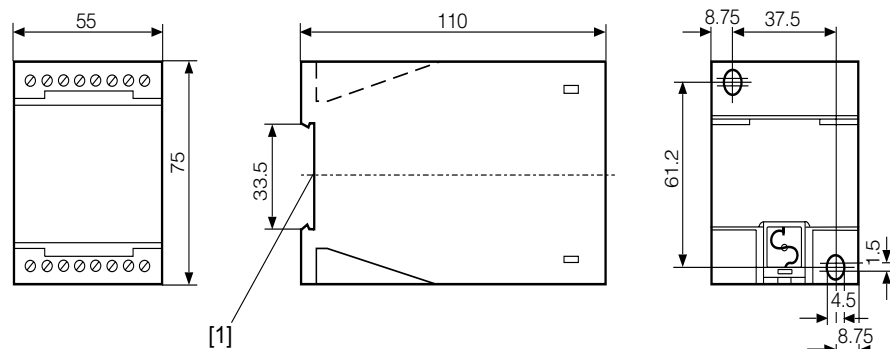
Electrical connection



486893707

- [1] Relay output
- [2] AC 110 V, AC 230 V supply voltage (47...63 Hz)
- [3] DC 24 V supply voltage
- [4] Signal
- [5] Encoder

Dimension drawing



487119371

- [1] DIN rail mounting

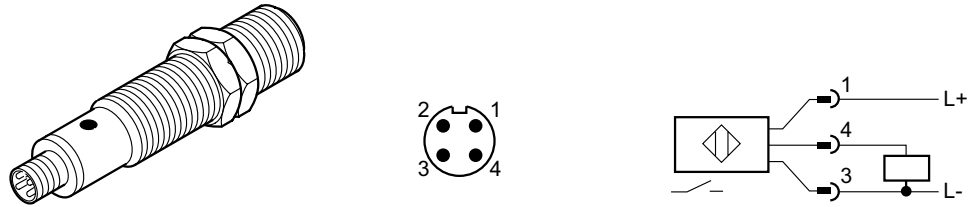
Technical data

- Operating voltage: AC 220 V or DC 24 V (part number 106 710 9)
- Operating voltage: AC 110 V (part number 106 781 8)
- Maximum switching capability of the output relay: 1250 VA (max. AC 8 A)
- Reference speed, starting bypass and switching hysteresis can be set on the speed monitor (→ chapter "Starting up the speed monitor").
- Degree of protection: IP 40 (IP 20 terminals)



4.3.2 Inductive encoder

Electrical connection



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Connect the UL-registered inductive encoder to the speed monitor as follows:

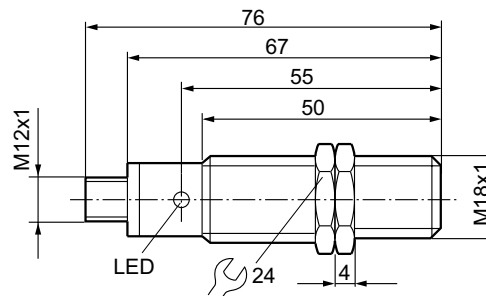
- via a three-core line with a maximum length of 500 m
- with a line cross section of 1.5 mm²
- Route the signal lines separately (not in multicore cables) and shield them, if necessary.



NOTE

The line between encoder and speed monitor as well as the M12 connecting socket of the encoder are not included in the scope of delivery of the speed monitoring.

Dimension drawing



488739723

Technical data

Electrical design		DC PNP	Operating distance	[mm]	5 ± 10 %
Output function		NO contact	Working distance	[mm]	0...4.05
Operating voltage	[V _{DC}]	10...36	Switching frequency	[Hz]	500
Current carrying capacity	[mA]	250	Ambient temperature	[°C]	–25...+80
Voltage drop	[V]	< 2.5	Enclosure, protection class		IP 67
Current consumption	[mA]	< 15 (24 V)	EMC		EN 60947-5-2; EN 55011 Class B



5 Startup

	STOP
	For startup, please do adhere to the safety notes in chapter 2 and to the safety notes of the publications indicated in chapter 1!

5.1 Notes

- Before startup, check that the oil level is correct. Refer to the respective nameplate for the lubricant fill quantities (→ chapter "lubricant fill quantities").
- Check the correct direction of rotation of the bevel-helical gear unit and make sure that the auxiliary drive does not rotate in operating direction.

	HAZARD!
	An overspeed may destroy the auxiliary drive Severe or fatal injuries. • Consult SEW-EURODRIVE if you want to change the direction of rotation.

- Before connecting the main and auxiliary drive, determine the rotating field of the three-phase mains using a phase-sequence indicator. Check as to whether both drives are connected according to the direction of rotation.
- Make sure, that it is not possible to operate the main drive against the blocking direction of the bevel-helical gear unit. Do observe the direction arrow on the bevel-helical gear unit.
- Interlock the main drive and the auxiliary drive so that only one of the two motors can be switched on.
- Check the disconnection function of the speed control.
- Make sure that the auxiliary drive is not overloaded. The auxiliary drive may only be operated with the output torque rates indicated in the order documents.
- Make sure that the rotary motion of the input shaft of the bevel-helical is not obstructed during auxiliary drive operation (e.g. maintenance). A brake on the input side of the main drive must be released for auxiliary drive operation.



5.2 Startup sequence

Adhere to the following startup sequence:

1. Auxiliary drive
2. Speed monitor
3. Main drive

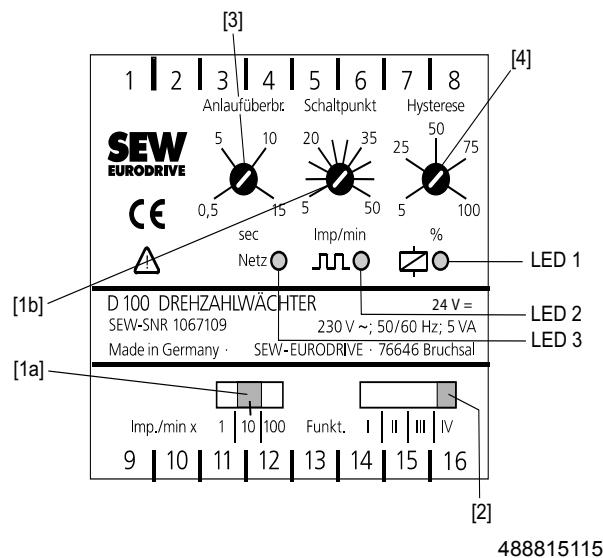
	STOP
	Always adhere to the startup sequence. It is a prerequisite for a safe startup.

5.2.1 Starting up the auxiliary drive

Make sure that the rotary motion of the input shaft of the bevel-helical is not obstructed during auxiliary drive operation. A brake on the input side of the main drive must be released for auxiliary drive operation.

5.2.2 Starting up the speed monitor

Setting the functions



[1a] [1b] Switching speed

[2] Switching function

[3] Starting lag

[4] Hysteresis

LED 1 = lights up when relay has picked up

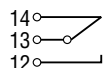
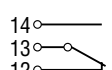
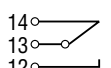
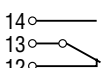
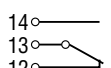
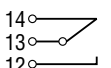
LED 2 = signals input pulse

LED 3 = shows correct operating voltage



Function	Description	Setting
Switching speed [1a] [1b]	allows for an exact setting of the desired value - Rough adjustment with step switch (1, 10, 100) - Fine adjustment with potentiometer (5 ... 50)	Step switch [1a] " 10 " Potentiometer setting [1b] " 7 " Switching speed = $10 \times 7 = 70$ pulses/min
Switching function [2]	Definition of the switching function: - Overrun or underrun of the switching speed - Relay setting for an overrun of underrun	Switching function IV
Starting lag [3]	Possibility to bypass the signal evaluation during the start (irrelevant for switching function IV)	set to the lowers value (= 0.5 s)
Hysteresis [4]	Difference between the switch-on and switch-off point of the relay.	set to the lowest value (= 5 %)

Overview of possible switching functions:

Switching function [2]	Relay position		
	when speed is		for normal operation and start bypass
	overrun	underrun	
I			
II			
III			
IV			

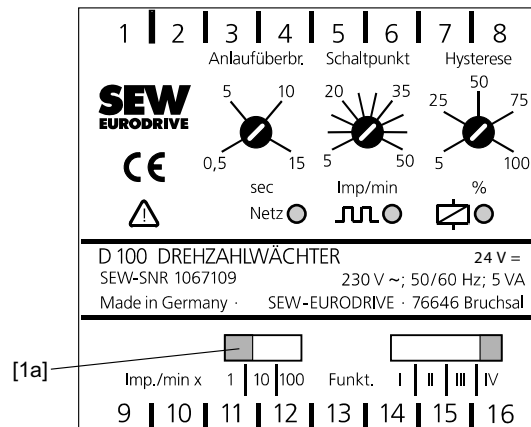


STOP

Integrate the speed monitor into the system circuitry so that the power supply to main drive and auxiliary drive is interrupted if the preset switching speed is overrun.



Operational check of the speed monitor



508095755

1. Switch on the auxiliary drive of the bucket elevator drive.
2. Set the step switch for setting the switching speed [1a] from "10" to "1" for a short time (the switching frequency is reduced from 70 to 7 pulses/min).
3. The speed monitor recognizes a speed overrun, the output relay picks up → the operational check is successful if the power supply to the main drive and the auxiliary drive is interrupted.
4. After a successful operational check, set the step switch for setting the switching speed [1a] back to "10" (the switching frequency is increased from 7 back to 70 pulses/min).

5.2.3 Starting up the main drive

Before starting up the main drive, determine the rotating field of the three-phase mains using a phase-sequence indicator. Make sure, that it is not possible to operate the main drive against the blocking direction of the bevel-helical gear unit. Do observe the direction arrow on the bevel-helical gear unit.



6 Inspection / Maintenance

	STOP
	- For Inspection / Maintenance, please do adhere to the safety notes in chapter 2 and to the safety notes of the publications indicated in chapter 1! - Adhere to the maintenance notes of the operating instructions indicated in chapter one!

6.1 Notes

	STOP
	- When changing the oil, always refill the gear unit with the grade of oil that was used before. Mixing oils of different grades or manufacturer is not permitted. Especially synthetic oils may not be mixed with mineral oils or other synthetic oils. Flush the gear unit with the new oil grade thoroughly when switching from mineral oil to synthetic oil or when switching from synthetic oil of one basis to synthetic oil of a different basis. - The appropriate oil of various lubricant manufacturers is indicated in the lubricant table → operating instructions operating instructions helical and bevel-helical gear units X.. series horizontal. - Information such as the oil grade, oil viscosity and required oil quantity is listed on the nameplate of the gear unit. - The oil quantity specified on the nameplate is an approximate quantity. The markings on the oil level glass or dipstick are the decisive indicators for the quantity of oil used to fill the unit. - Only change the oil when the gear unit is warm. - When changing the oil, flush the housing thoroughly with oil to remove oil sludge, oil residue, and abrasion products. Use the same grade of oil that is used to operate the gear unit. Viscous oil must first be heated up. Fill with fresh oil only after all residues have been removed. - The position of the oil level and oil drain plugs and the breather valve depends on the mounting position. Refer to the diagrams of the mounting positions. - The used oil must be collected and recycled according to the applicable regulations.



6.2 Inspection and maintenance intervals

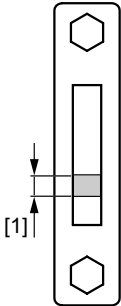
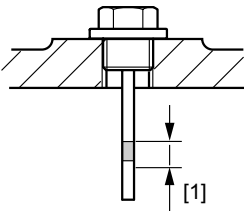
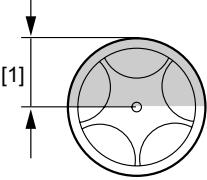
Time interval	What to do?
Daily	- Check the housing temperature: - with mineral oil: Max. 194.00 °F - with synthetic oil: Max. 212.00 °F - Check gear unit noise
Monthly	- Check gear unit for signs of leakage - Check oil level (see chapter 6.3)
After 500 hours of operation	First oil change after initial startup
Every 3,000 operating hours, at least every 6 months	- Checking the oil consistency - Fill regreasable sealing systems with grease
Depending on the operating conditions, at the latest every 12 months	- Check whether retaining screws are tightly secured - Check the condition of the oil-water cooling system - Clean oil filter, replace filter element if necessary - Check the wear of the lining of the torque-controlled backstop (see chapter 6.5)
At least every 3 years, depending on the operating conditions (see figure on next page)	Change mineral oil
At least every 5 years, depending on the operating conditions (see figure on next page)	Change synthetic oil
Varying (depending on external factors)	- Check the breather plug, replace if needed. - Clean the gearcase surface and fan - Check the alignment of the input and output shaft - Repair or renew the surface/anticorrosion coating - Replace backstop The backstop may wear off especially during operation below lift-off speed. This is why you should consult SEW-EURODRIVE for defining the maintenance intervals for: - Input speed rates $n_1 < 1400$ rpm - X4K.. design with $i_{tot} \geq 200$ - Check built-in coolers (such as water cooling covers/cartridges) for deposits - Check oil heating (at same time as oil change) - Are all connection cables and terminals tightened securely and free from corrosion? - Clean encrusted heating elements, replace if needed



6.3 Checking the oil level

	STOP - Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants. - The position of the oil level plug, oil drain plugs, and breather valve depends on the mounting position. Refer to the diagrams of the mounting positions.
	HAZARD! Risk of crushing if the drive starts up unintentionally. Severe or fatal injuries. Disconnect the gearmotor from the power supply before starting work and protect it against unintentional re-start.
	WARNING Danger of burns due to hot gear unit and hot gear unit oil. Fatal injuries. Let motor cool down before beginning work.

- For bevel-helical gear units with oil level glass:
 - Visually check that the oil level is correct (= centered between Min./Max. markings) Correct if necessary (see following illustration).
 - When filling for the first time, the oil level must be checked once again after 15 minutes (equalization of level between gear unit interior and oil level glass).
- For bevel-helical gear units with oil dipstick (optional):
 - Unscrew the oil dipstick and remove it.
 - Clean the oil dipstick and re-insert it by turning it hand-tight into the bevel-helical gear unit up to the stop.
 - Remove dipstick again and check oil level. Correct, if necessary (= centered between Min./Max. markings):

Oil level glass	Dipstick	Oil sight glass
		

[1] The oil level should be within this range



6.4 Changing the oil

6.4.1 Procedure

Only change the oil when the gear unit is at operating temperature.



HAZARD!

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before starting work and protect it against unintentional re-start.

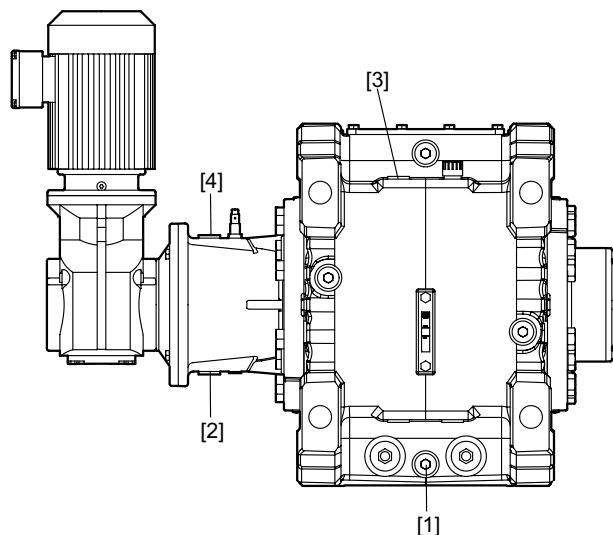


WARNING

Danger of burns due to hot gear unit and hot gear unit oil.

Fatal injuries.

- Let motor cool down before beginning work.
- The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil completely.



509709195

- [1] Oil drain plug bevel-helical gear units
- [2] Oil drain plug auxiliary drive adapter
- [3] Oil filling plug bevel-helical gear unit
- [4] Oil filling plug of the auxiliary drive adapter

1. Place a container underneath the oil drain plug [1/2] of the bevel-helical gear unit and the auxiliary drive adapter.
2. Remove the oil filling plug [3/4] and the oil drain plug [1/2] of the bevel-helical gear unit and the auxiliary drive adapter.



3. Drain all the oil.



NOTE

When changing the oil, clean the gearcase thoroughly to remove oil residues and abrasion. Use the same oil grade as for the operation of the bevel-helical gear unit.

4. Re-insert the oil drain plug of the bevel-helical gear unit [1] and the auxiliary drive adapter [2].

5. Fill the prescribed partial oil quantity into the auxiliary drive adapter via the oil filling plug [4].



NOTE

The oil volume indicated on the nameplate is a guide value representing the total fill quantity. The auxiliary drive adapter is to be filled with a prescribed partial quantity.

Gear unit	Auxiliary drive adapter	
	"Empty buckets" ltr.	"Full buckets" ltr.
X3K.180 / X3K.190	4	6
X3K.200 / X3K.210	5	9
X3K.220 / X3K.230	8	13
X3K.240 / X3K.250	10	16

- Use a funnel to fill the oil (filter mesh max. 25 µm).

6. Fill the rest of the oil into the bevel-helical gear unit via the oil filling plug [3].

Gear unit	Bevel-helical gear units ltr.
X3K.180 / X3K.190	75
X3K.200 / X3K.210	104
X3K.220 / X3K.230	143
X3K.240 / X3K.250	176

- Use a funnel to fill the oil (filter mesh max. 25 µm).

7. Check whether the oil level is correct using the oil level glass or the oil dipstick.

8. Clean the oil filter, replace the filter element if necessary (when using an external oil-air or oil-water cooling system).



STOP

Any dripping oil must be removed immediately with an oil binding agent.



6.5 Checking the wear of the torque-controlled backstop



HAZARD!

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the drives when conveyor belts are empty, i.e. no restoring moment at the backstop due to conveyed material. Make sure that there is no torque applied to the backstop.

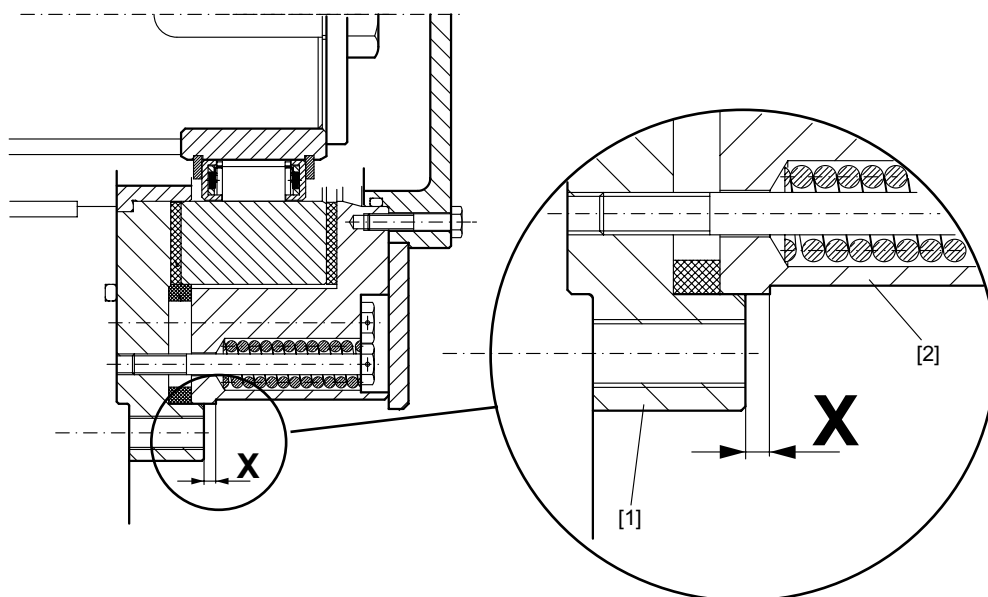


WARNING

Danger of burns due to hot gear unit and hot gear unit oil.

Fatal injuries.

- Let motor cool down before beginning work.



539297547

[1] Backstop flange

[2] Housing

Check the wear of the lining by measuring the **reference dimension "X"** between the fixed backstop flange [1] and the bottom edge of the groove of the housing [2]. The distance must not be lower than 0.8 mm.



STOP

If the distance "X" is equal or below 0.8 mm, a fault-free operation of the torque-control is not guaranteed. Contact SEW-EURODRIVE



7 Malfunctions

7.1 Notes

	STOP - For startup, please do adhere to the safety notes in chapter 2 and to the safety notes of the publications indicated in chapter 1! - When eliminating malfunctions, the bevel-helical gear unit and additional equipment must be deactivated. Prevent the drive unit from starting up unintentionally (for example, by locking the key switch or removing the fuses from the power supply). Place an information sign near the ON switch to warn that the gear unit is being worked on.
	! WARNING Danger of burns due to hot gear unit Fatal injuries. Let motor cool down before beginning work.
	NOTE Malfunctions that occur during the warranty period that require repair to the bucket elevator drive may only be resolved by SEW-EURODRIVE. After the warranty period has elapsed, we recommend that our customers contact our customer service when malfunctions occur and their cause is not clear.

7.2 Customer service

Please have the following information to hand if you require the assistance of our customer service:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- A digital photograph if possible



7.3 Possible malfunctions

Malfunction	Possible cause	Remedy
Temperature at backstop too high No blocking function	Damaged/defective backstop	• Check backstop; replace if necessary • Contact the customer service
Main drive does not start	• Main drive defective • Overload at the output side • Wrong direction of rotation, motor rotates against blocking direction of the backstop. • Cage with sprags of the backstop not installed correctly or defective. • Overrunning clutch blocked (cage with sprags of the overrunning clutch not installed correctly or overrunning clutch defective) • Main drive and auxiliary drive not interlocked correctly • Speed monitor of the overrunning clutch not set correctly	• Repair motor in a specialist workshop • Reduce load • Change rotational direction of the motor (swap over two phases) • Install cage of the backstop the other way around (180°) or replace it • Install cage of the overrunning clutch the other way around (180°) or replace it • Check the speed monitor setting • Contact the customer service
Auxiliary drive does not start	• Auxiliary drive is defective • Overload at the output side • Auxiliary drive rotates against blocking direction of the backstop	• Repair motor in a specialist workshop • Reduce load • Install cage of the overrunning clutch the other way around (180°) or replace it, and change direction of rotation • Contact the customer service
Auxiliary drive does start but the output shaft of the bevel-helical gear unit does not rotate	• Wrong direction of rotation • Cage with sprags of the overrunning clutch no installed correctly • Overrunning clutch defective	• Change rotational direction of the motor (swap over two phases) • Install cage of the overrunning clutch the other way around (180°) or replace it • Contact the customer service
Main drive does start although the auxiliary drive with speed monitor is in operation	• Interlocking between main drive and auxiliary drive defective	• Check wiring



8 Lubricant Fill Quantities

8.1 Bucket elevator drive



NOTE

- The specified fill quantities are only given as a guideline. The precise values vary depending on the gear ratio.
- Different oil quantities are required for the auxiliary drive adapter in "empty buckets" design and in "full buckets design" Observe the information in the following table.
- The markings on the oil level glass or dipstick are the decisive indicators for the quantity of oil used to fill the unit.

Gear unit	Total quantity Bucket elevator drive		Partial quantity		
	"Empty buckets" ltr.	"Full buckets" ltr.	Bevel-helical gear units ltr.	Auxiliary drive adapter "Empty buckets" ltr.	Auxiliary drive adapter "Full buckets" ltr.
X3K.180	78	80	74	4	6
X3K.190	79	81	75	4	6
X3K.200	109	113	104	5	9
X3K.210	109	113	104	5	9
X3K.220	151	156	143	8	13
X3K.230	151	156	143	8	13
X3K.240	186	192	176	10	16
X3K.250	186	192	176	10	16

8.2 Auxiliary drive

Gear unit	Auxiliary drive "empty buckets"		Auxiliary drive "full buckets"	
	Type	Fill quantity ltr.	Type	Fill quantity ltr.
X3K.180	KF77	5.9	KF97	21.5
X3K.190	KF77	5.9	KF97	21.5
X3K.200	KF77	5.9	KF97	21.5
X3K.210	KF77	5.9	KF97	21.5
X3K.220	KF87	11.9	KF107	35.1
X3K.230	KF87	11.9	KF107	35.1
X3K.240	KF87	11.9	KF127	55
X3K.250	KF87	11.9	KF127	55



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Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
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Service		Str. Rabochaja 23-B, Office 409	Fax +380 56 372 2078
		49008 Dnepropetrovsk	http://www.sew-eurodrive.ua
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USA			
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Assembly		1295 Old Spartanburg Highway	Fax Sales +1 864 439-7830
Sales		P.O. Box 518	Fax Manuf. +1 864 439-9948
Service		Lyman, S.C. 29365	Fax Ass. +1 864 439-0566
			Telex 805 550
			http://www.seweurodrive.com
			cslyman@seweurodrive.com
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Service		Hayward, California 94544-7101	cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC.	Tel. +1 856 467-2277
		Pureland Ind. Complex	Fax +1 856 845-3179
		2107 High Hill Road, P.O. Box 481	csbridgeport@seweurodrive.com
		Bridgeport, New Jersey 08014	
	Dayton	SEW-EURODRIVE INC.	Tel. +1 937 335-0036
		2001 West Main Street	Fax +1 937 440-3799
		Troy, Ohio 45373	cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC.	Tel. +1 214 330-4824
		3950 Platinum Way	Fax +1 214 330-4724
		Dallas, Texas 75237	csdallas@seweurodrive.com
Additional addresses for service in the USA provided on request!			
Venezuela			
Assembly	Valencia	SEW-EURODRIVE Venezuela S.A.	Tel. +58 241 832-9804
Sales		Av. Norte Sur No. 3, Galpon 84-319	Fax +58 241 838-6275
Service		Zona Industrial Municipal Norte	http://www.sew-eurodrive.com.ve
		Valencia, Estado Carabobo	ventas@sew-eurodrive.com.ve
			sewfinanzas@cantv.net



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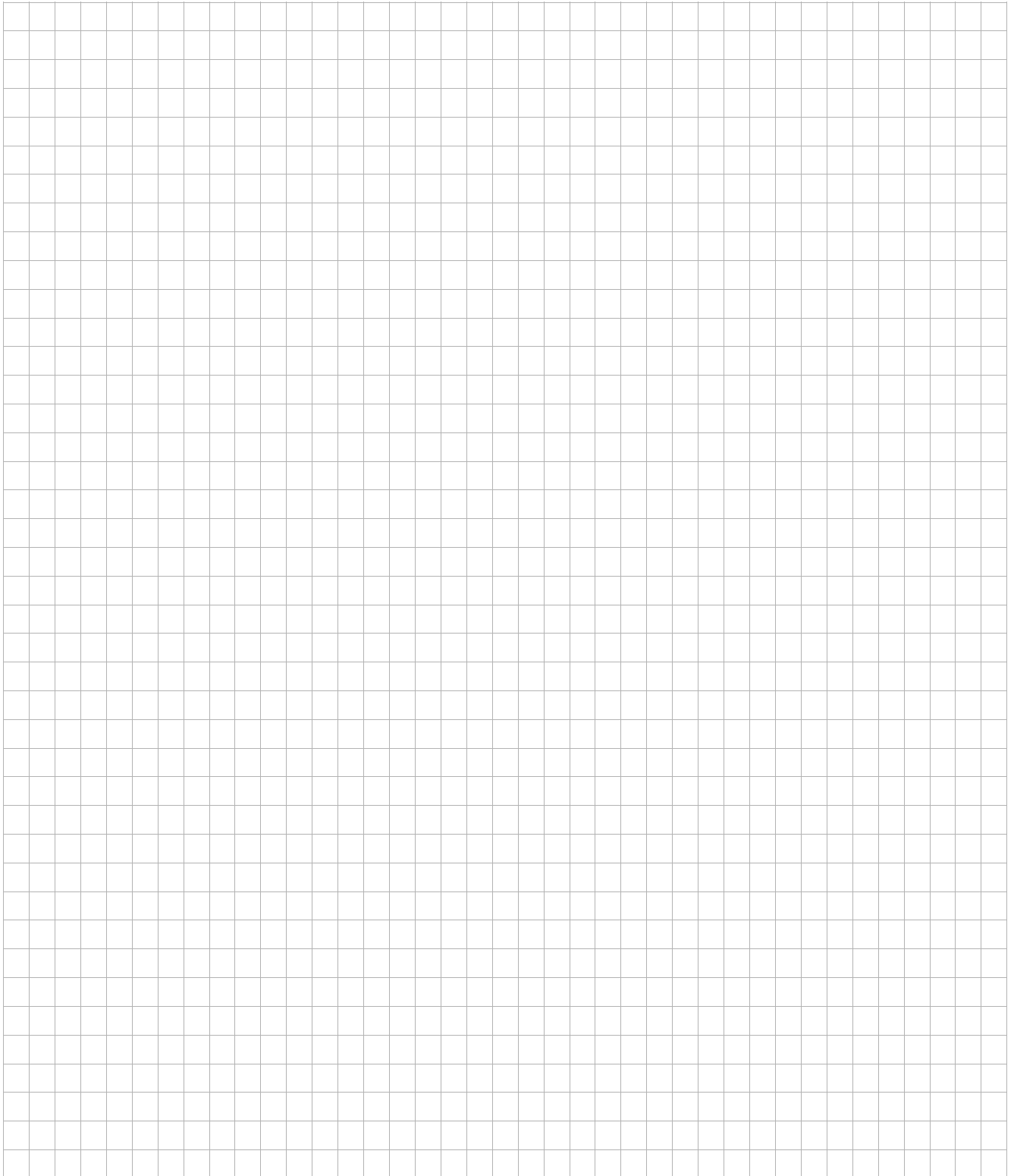
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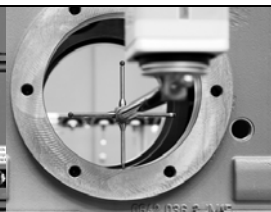
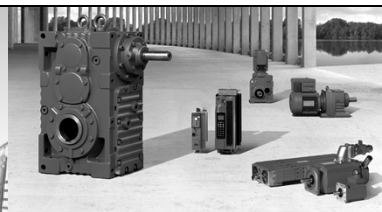
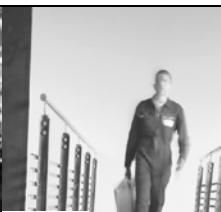
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